Vocabulary

Word	Meaning
Consistent	If it has at least one solution.
Row equivalent	If a sequence of row operations transforms one matrix into the other.
Unique solution	If and only if there are no free variables
Homogeneous	Linear systems of the form $A\mathbf{x} = \mathbf{0}$
Inhomogeneous	Linear systems of the form $A\mathbf{x} = \mathbf{b}$ where $\mathbf{b} \neq \mathbf{0}$
Trivial solution	The solution is the zero vector
Linearly independent	If no vector can be made from other vectors
Row operations	Addition, Interchange, Scaling
Pivot position	A leading 1 in the RREF of A
Pivot column	Is a column of A that contains a pivot position
Domain	$T : \mathbb{R}^n \to \mathbb{R}^m$; $\mathbb{R}^n$ is the domain of T
Codomain	$T : \mathbb{R}^n \to \mathbb{R}^m$; $\mathbb{R}^m$ is the codomain of T
Image	The vector $T(\vec{x})$ is the image of $\vec{x}$ under T
Range	The set of all possible images $T(\vec{x})$ or simply the **span of A**
Standard vectors	The column of the identity matrix (think $\begin{bmatrix}1\\0\end{bmatrix}$ and $\begin{bmatrix}0\\1\end{bmatrix}$)
Onto	All the elements in the codomain are mapped to. (A spans the entire codomain), Every **row** is pivotal
One-To-One	Each mapping is unique (2 vectors can **NOT** map to the same vector), Every **column** is pivotal
Transpose	The matrix whose columns are the rows of A
Invertible	$A \in \mathbb{R}^{n \times n}$ is invertible if there is a $C \in \mathbb{R}^{n \times n}$ such that: $AC = CA = I_n$
Elementary Matrix	Differs from I_n by one row operation.
Singular	A matrix that is not invertible (A^{-1} DNE)
Subset	A subset of $\mathbb{R}^n$ any collection of vectors that are in $\mathbb{R}^n$
Subspace	If $H \in \mathbb{R}^n$, for $c \in \mathbb{R}$ and $\vec{u}, \vec{v} \in H$, $c\vec{u} \in H$ and $\vec{u} + \vec{v} \in H$ must be true if H is a subspace.
Column Space	This is a subspace spanned by the column of A.
Null Space	This is a subspace spanned by all $\vec{x}$ such that $A\vec{x} = \vec{0}$.

Word	Meaning
Basis	This is a set of linearly independent vectors in H that spans H assuming H is a subspace.